from the Upper Coal Measures of Newcastle (N.S.W.). Much light on the phylogeny of the Insecta may be expected from such studies in Australian palæontology, and the author gives us (*l.c.*, part 1) an example of this in the type of a new order, the Protomecoptera—"a very remarkable fossil from the Ipswich [Queensland] beds . . . the direct connecting-link between the Palæozoic Palæodictyoptera on one hand, and the recent Mecoptera on the other."

In describing these primitive metabolous insects, and comparing them with Neuroptera, Trichoptera, and Lepidoptera, Mr. Tillyard lays stress on the presence in the Mecoptera and Planipennia of a frenulum or group of wing-coupling bristles, comparable with the well-known organ on the hind-wing of most moths, and argues thence in support of Dr. Handlirsch's contention for a close relationship between all these orders. In a very short but important note (*Entom. News*, vol. xxix., p. 99) Mr. Tillyard points out that a frenulum of simple type is present in those minute primitive moths the Micropterygidæ, which have usually been regarded as devoid of that organ. In thus enforcing evidence for the relationship of archaic members of various orders of insects, the author well justifies his use of the morphological method in entomology. G. H. C.

THE PROMOTION OF TEXTILE INDUSTRIES.[1]

THE Departmental Committee appointed by the Board of Trade to consider the position of the textile trades after the war has presented a most interesting report, which is unanimous except for small details concerning certain tariffs.

The report sets out very clearly the dominant position of the Allied countries in respect of the raw materials of the more important textile trades, and lays special emphasis on the exceptional and powerful position which the British Empire holds with regard to the production in particular of wool, jute, and the finest qualities of cotton. The Committee is particularly insistent that this position must be safeguarded by continuous and systematic *scientific* research on the raw materials to improve production both in quality and yield. A striking illustration is quoted to show how scientific sheep-breeding in Australia has improved the quality of wool clipped per head; whilst special emphasis is laid on the urgent necessity for the systematic and scientific study of the growing of cotton. The fringe of this latter subject has only just been touched, and there are immense possibilities in the production of cotton modified by the grower to suit the user.

The Committee, moreover, advocates scientific research on the fundamental principles underlying the various manufacturing processes of the several textile industries, and it is significant that this Committee, composed mainly of prominent manufacturers, emphasises so strongly its belief that such research will stimulate the development and prosperity of the industries represented on it. Three important lines of inquiry are suggested:—

(1) Scientific research in connection with raw materials.

(2) Scientific research in connection with the improvement of processes such as carbonising, carding, spinning, weaving, dyeing, bleaching, printing, and finishing.

(3) Technical investigation with regard to the improvement of machinery.

The machinery and methods of the present day are adapted to suit the various types of textile fibres commonly produced, but it is considered that scientific research in connection with the raw materials will evolve and select special types suited to the products required, and that then the cultivation of these types might be encouraged. In manufactures the discovery of the mercerising process of cotton and the production of artificial silk are quoted as instances to show that great improvements can be effected in existing processes and in the discovery of entirely new ones.

The Committee feels unable to recommend the compulsory adoption of the metric system at the present time so far as the textile trades are concerned. The great British textile trades, more particularly the cotton trade, are so predominant in the world that similar industries in other countries have had, in the main, to follow their lead and accept their technical standards, whilst all the textile machinery used in this country and supplied by British manufacturers to foreign manufacturers is based upon British measures. The yard is the standard of measurement for textile goods in almost all the great markets of the East, of the United States of America, and throughout the British Empire, and the larger proportion of our textile export trade is done with non-metric countries. In fact, it is considered that the adoption of the metric system can be brought about in this country, so far as the textile trades are concerned, only with the full concurrence and co-operation of the whole British Empire and the United States of America.

The report criticises the British system of technical and art education, which, in the opinion of the Committee, has failed to supply the textile industries with a sufficient number of highly trained workers and managers. It is suggested indirectly that the Education Act of 1902 is partly responsible for this, in that the management of the majority of technical schools was then vested in municipal bodies, which are elected for quite different purposes, and rarely prove attractive to local manufacturers—a drawback not corrected by the co-option from outside the local education authorities of manufacturers on school management sub-committees. It is noteworthy that this Committee, composed mainly of large employers, considers that it is urgently necessary to awaken the employers of the textile industry to the value of adequate education, particularly of their higher staffs. R. H. P.

IRISH SEA PLANKTON.[1]

THE importance of studying the common plankton organisms is shown by Prof. Herdman in his "Spolia Runiana," where, basing his results on more than ten years' systematic collecting and working out of standard plankton hauls in the Irish Sea, he points out how the results depend mainly on the presence of only a few genera and species which appear at certain seasons with great regularity and constitute the bulk of the food supply available in the sea. He therefore makes a careful analysis of the quantitative distribution of the six commonest copepods as representative of the zooplankton, each belonging to a separate genus, and the seven commonest diatom genera as representative of the phytoplankton, and the results show that the seasonal distribution of these forms is remarkably constant. Thus the diatoms have two maxima in the year, the larger in spring, the lesser in autumn, the copepods always increasing after and not with the diatoms, so that their maximum is in the summer. The diatoms are thus the forerunners of the small

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[1] Report of the Departmental Committee appointed by the Board of Trade to consider the Position of the Textile Trades after the War. 1918. (Cd. 9070.) Price 1*s.* 3*d.* net.

[1] "Spolia Runiana." III. "Distribution of Certain Diatoms and Copepoda throughout the Year." By Prof. W. A. Herdman. Journ. Linn. Soc., Botany, vol. xliv., p. 173, 1918, and Zoology, vol. xxxiv., p. 95, 1918.

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plankton animals, including the copepods, which feed on the diatoms, the copepods in their turn serving as food for nearly all young fish and certain adults, such as the herring and mackerel.

The maxima of the various genera show much agreement with the records from the English Channel, but the interesting fact is brought out that Skeletonema, a coastal diatom enormously abundant at Kiel and very common in the Channel, is apparently quite rare in the Irish Sea even close to land, whilst it is the commonest form in some of the lochs in the west of Scotland.

The copepods Calanus and Temora, which contain a large amount of oil, occur at times in enormous numbers and form an important food for the herring and mackerel, which follow them in shoals and feed voraciously on them disappearing when the copepods go. This is a good illustration of the prominent truth brought out by this plankton investigation that, although there is a very large amount of food available in the sea, it is not evenly distributed, and that all animals feeding on the plankton must seek out the food they require. The varying distribution of the plankton is thus the chief cause of the movement and migrations of those animals which feed on it.

In the concluding remarks various theories of the origin of these plankton maxima are discussed, the author inclining to the view that here sunlight plays the most important part, and that increased alkalinity of the sea being due to the reduction of carbon dioxide is the result, and not the cause, of the activity of the plankton.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

Cambridge.—Dr. F. G. Chandler, of Jesus College, has been awarded the Raymond Horton-Smith prize for his thesis on "Empyema."

London.—A Mitchell studentship of 100*l*. is offered to a graduate having the necessary qualifications to study and investigate some definite feature of business or industrial organisation at home or abroad. Applications will be received by the Academic Registrar not later than December 31 next.

The following are among the public lectures at University College arranged for during the new term:—"Economy of Fuel in Private Households," A. H. Barker, on Wednesday, October 9, at 7 p.m.; "The Scientific Problems of Radio-telegraphy," Prof. J. A. Fleming, on Wednesdays, October 30, November 6, 13, 20, and 27, and December 4, at 5 p.m.; "The Nature and Use of 'Tones' in Chinese and Other Languages," D. Jones, on Monday, October 21, at 5 p.m.; "The Nature of Language," H. E. Palmer, on Thursdays, October 10, 17, 24, and 31, November 7 and 14, at 5 p.m.; "The Problem of International Language" (with special reference to Esperanto and Ido), H. E. Palmer, on Thursdays, November 21 and 28, December 5 and 12, at 5 p.m.; "Wound Shock," Prof. W. M. Bayliss, on Fridays, November 22 and 29, at 5 p.m.; and "French Science" (with lantern illustrations), Prof. H. L. Joly, on Tuesdays, October 22 and 29 and November 5, at 5 p.m.

Mr. C. E. Ashford, headmaster of the Royal Naval College, Dartmouth, has been appointed Adviser on Education to the Board of Admiralty for the duration of the war, continuing in his former position.

Dr. W. M. Polk, late dean of the Medical College of Cornell University, has bequeathed the sum of 1000*l*. to the University for the continuation of the John Metcalf Polk scholarship in medicine.

The current calendar of the Edinburgh and East of Scotland College of Agriculture, copies of which can be obtained on application to the secretary, 13 George Square, Edinburgh, contains full details of the various available courses of instruction in agriculture, horticulture, and forestry. All the courses of study, it may be noted, are open to women.

The following lectures have been arranged for delivery at the Royal Sanitary Institute by the Child-Study Society:—Thursday, October 10, "Training the Children for Citizenship in America," Mrs. K. Boulker; Thursday, November 7, "The Girl Guide Movement," Lady Baden-Powell; and Thursday, November 28, "Sight-saving Schools," N. Bishop Harman.

The Universities Bureau of the British Empire has compiled a handbook of the "Universities of the United Kingdom of Great Britain and Ireland," which the Board of Education has published as No. 33 of its Educational Pamphlets at the price of 9*d*. net. In the spring of 1918 the Council of National Defence of the United States invited the universities of the United Kingdom to send delegates to visit American universities so as to establish relations of co-operation and co-ordination. The present handbook was prepared to place the delegates in a position to supply information about the organisation and resources of the individual universities of the United Kingdom. The descriptions in it relate to normal times, and the figures as to the number of teachers and students are for the last normal session 1913–14. The pamphlet states that inquiries regarding any matters connected with university education may be addressed to the Hon. Secretary of the Bureau at the Imperial Institute, London, S.W.7.

SOCIETIES AND ACADEMIES.

Cape Town.

Royal Society of South Africa, July 17.—Dr. A. Jasper Anderson in the chair.—A. **Ogg**: The electrostatic deflection in a cathode-ray tube. In the ordinary Thomson cathode-ray tube for determining the value of e/m for cathode rays, the irregularity of the electrostatic field near the edges of the charged plates has to be allowed for. It is interesting to find the electrostatic deflection when the rays are projected parallel to the plates, but at some distance from them. Methods for making the calculation were given.—Prof. J. D. F. **Gilchrist**: Note on a disease in the snoek (*Thyrsites atun*). The snoek, one of the most important Cape fishes from an economic point of view, is well known to be found frequently in a "pap" or soft condition. This is attributed by the fishermen to the fact that it has not been properly killed on capture, the consequence being that it struggles about in the bottom of the boat, and, in doing so, bruises the flesh to such an extent as to produce the condition mentioned. This condition may occur a few hours after the fish has been caught, and may quickly become so marked that the whole of the muscles, especially of the back, appear quite soft and liquid. The process is believed to be totally distinct from decay by putrefaction or by softening of the flesh by exposure to the heat of the sun, which also frequently occurs. As it was suspected that this condition might be brought about by the presence and rapid multiplication of some protozoal parasite in the muscles, the diseased tissue was examined microscopically, and after staining with methylene-blue and other reagents the presence of very numerous spore-like bodies was

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